

What is claimed is:

- 1           1.       A process for producing a sealant comprising the step of:  
2           contacting in a reactor under reaction conditions  
3                   a polymer comprising at least one vinyl, acrylate, or methacrylate monomer  
4                   and at least one silane comonomer,  
5                   at least one polymer capping agent,  
6                   a catalyst, and  
7                   a reactive diluent.  
8           2.       The process of claim 1, wherein the reactive diluent comprises an alkylene  
9           carbonate.  
1           3.       The process of claim 1, wherein the reactive diluent is propylene carbonate.  
1           4.       The process of claim 1, wherein the silane comonomer of the polymer is  
2           selected from the group consisting of methyl trimethoxysilane, methyl triethoxysilane, octyl  
3           triethoxysilane, methyl trioximinosilane, vinyl trimethoxysilane, vinyltriethoxysilane,  
4           vinyltris (2-methoxyethoxy) silane, 3-[tris (trimethylsiloxy) silyl] propyl methacrylate, vinyl  
5           methyldimethoxy silane, vinyl methyldiethoxy silane, vinylphenyldimethoxysilane vinyl  
6           oximino silane, and mixtures thereof.  
1           5.       The process of claim 1, wherein the silane comonomer is a mixture of methyl  
2           trimethoxysilane and vinyl trimethoxysilane.  
1           6.       The process of claim 1, wherein the vinyl, acrylate, or methacrylate monomer  
2           is substantially linear.

1           7.       The process of claim 1, wherein the acrylate monomer is selected from the  
2 group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethyl hexyl acrylate, and  
3 mixtures thereof.

1           8.       The process of claim 1, wherein the methylacrylate monomer is selected from  
2 the group consisting of lauryl methacrylate, methyl methacrylate, ethyl methacrylate, butyl  
3 methacrylate octyl methacrylate and stearyl methacrylate, and mixtures thereof.

1           9.       The process of claim 1, wherein the vinyl monomer is selected from the group  
2 consisting of vinyl acetate, acrylonitrile, methacrylonitrile, styrene, dioctyl fumarate, dioctyl  
3 maleate and maleic anhydride.

1           10.      The process of claim 1, wherein the monomer comprises butylacrylate,  
2 methylacrylate, and lauryl methacrylate.

1           11.      The process of claim 1, wherein the polymer capping agent is an alkoxy  
2 silane.

1           12.      The process of claim 1, wherein the polymer capping agent is selected from  
2 the group consisting of mercapto — containing alkoxy silanes,  
3 g-glycidoxypentyltrimethoxysilane and mixtures thereof.

1           13.      The process of claim 1, wherein the sealant contains in the range from about  
2 90 to about 99 weight percent solid yield.

1           14.      The process of claim 1, wherein the sealant contains in the range of from  
2 about 95 to about 99 weight percent solid yield.

1           15.      The process of claim 1, wherein the sealant contains in the range of at least 98  
2 weight percent solid yield.

1           16.     The process of claim 1, wherein the sealant contains a glass peel cohesive  
2 failure (CF) value in the range of from about 16 to 36 pounds-force per inch of width, and an  
3 aluminum peel adhesive failure (AF) value in the range of from about 8.75 to about 28.75  
4 pounds-force per inch of width.

1           17.     The process of claim 1, wherein the polymer has a molecular weight in the  
2 range of from about 50,000 g/mol to about 150,000 g/mol.

1           18.     The process of claim 1, wherein the sealant has a viscosity in the range of  
2 from about 1000 to about 50,000 Centipose and determined using a 70% solution in toluene  
3 at room temperature.

4           19.     The process of claim 1, wherein the catalyst is a mixture of t-butyl peroctoate,  
5 toluene, and dioctyl tin dilaurate.

1           20.     A sealant composition comprising:  
2           a polymer comprising at least one vinyl, acrylate or methacrylate monomer and at  
3 least one silane comonomer,  
4           at least one polymer capping agent,  
5           a catalyst, and  
6           a reactive diluent.

1           21.     The sealant of claim 20, further comprising an additive.

1           22.     The sealant of claim 21, wherein the additive comprises fumed silica,  
2 g-glycidoxypropyltrimethoxysilane, and a wetting agent.

1           23.     The sealant of claim 20, wherein the reactive diluent comprises an alkylene  
2 carbonate.

1           24.     The sealant of claim 20, wherein the reactive diluent is propylene carbonate.

1           25.    The sealant of claim 20, wherein the silane comonomer of the polymer is  
2   selected from the group consisting of methyl trimethoxysilane, methyl triethoxysilane, octyl  
3   triethoxysilane, methyl trioximinosilane, vinyl trimethoxysilane, vinyltriethoxysilane,  
4   vinyltris (2-methoxyethoxy) silane, 3-[tris (trimethylsiloxy) silyl] propyl methacrylate, vinyl  
5   methyldimethoxy silane, vinyl methyldiethoxy silane, vinylphenyldimethoxysilane vinyl  
6   oximino silane, and mixtures thereof.

1           26.    The sealant of claim 20, wherein the silane comonomer is a mixture of  
2   methyltrimethoxysilane and vinyl trimethoxysilane.

1           27.    The sealant of claim 20, wherein the vinyl, acrylate, or methacrylate monomer  
2   is substantially linear.

1           28.    The sealant of claim 20, wherein the acrylate monomer is selected from the  
2   group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, 2-ethyl hexyl acrylate, and  
3   mixtures thereof.

1           29.    The sealant of claim 20, wherein the methylacrylate monomer is selected from  
2   the group consisting of, lauryl methacrylate, methyl methacrylate, ethyl methacrylate, butyl  
3   methacrylate octyl methacrylate and stearyl methacrylate, and mixtures thereof.

1           30.    The sealant of claim 20, wherein the vinyl monomer is selected from the  
2   group consisting of vinyl acetate, acrylonitrile, methacrylonitrile, styrene, dioctyl fumarate,  
3   dioctyl maleate and maleic anhydride.

1           31.    The sealant of claim 20, wherein the monomer comprises butylacrylate,  
2   methylacrylate, and lauryl methacrylate.

1           32.    The sealant of claim 20, wherein the polymer capping agent is an alkoxy  
2   silane.

1           33.     The sealant of claim 20, wherein the polymer capping agent is selected from  
2 the group consisting of mercapto – containing alkoxy silanes, g-glycidoxypropyltrimethoxy  
3 silane, and mixtures thereof.

1           34.     The sealant of claim 20, wherein the sealant contains in the range of from  
2 about 90 to about 99 weight percent solid yield.

1           35.     The sealant of claim 20, wherein the sealant contains in the range of from  
2 about 95 to about 99 weight percent solid yield.

1           36.     The sealant of claim 20, wherein the sealant contains in the range of at least  
2 98 weight percent solid yield.

1           37.     The sealant of claim 20, wherein the sealant has a glass peel cohesive failure  
2 (CF) value in the range of from about 16 to 36 pounds-force per inch of width, and an  
3 aluminum peel adhesive failure (AF) value in the range of from about 8.75 to about 28.75  
4 pounds-force per inch of width.

1           38.     The sealant of claim 20, wherein the polymer contains a molecular weight in  
2 the range of from about 50,000 g/mol to about 150,000 g/mol.

1           39.     The sealant of claim 20, wherein the sealant contains a viscosity in the range  
2 of from about 1000 to about 50,000 Centipose and determined using a 70% solution in  
3 toluene at room temperature.

1           40.     The sealant of claim 20, wherein the catalyst is a free radical genemtor  
2 selected from the group consisting of azo, peroxide, and hydroperoxide catalysts, and  
3 mixtures thereof.

1           41.     The sealant of claim 20, wherein the catalyst is a mixture of t-butyl  
2 peroctoate, toluene, and dioctyl tin dilaurate.